2C. AGE-SPECIFIC MORTALITY

INFANT MORTALITY

Infant mortality is defined as the number of deaths within the first year of life. The infant mortality rate (IMR) is computed as the number of infant deaths in a calendar year per 1,000 live births recorded for the same period.

In 1999, 547 infants died before reaching their first birthday, for a record low infant mortality rate of 6.8 deaths per 1,000 live births in that year (**Table 2C-1**). The 1999 IMR was not only the lowest Arizona rate in fifty years (**Table 8C-2**), but it was 2.9 percent lower than the year 2000 target rate of 7.0/1,000.

The decline in postneonatal mortality (between 28 days and 365 days after birth, PNMR) from 1998 to 1999 was almost three times greater (17.9 vs. 6.3 percent) than the decline in the rate of deaths in the neonatal period (from birth to 28 days of age, NMR (**Figure 2C-1**, **Table 2C-3**). Fifty-one out of every 100 infant deaths in Arizona in 1999 occurred during the first week of life **(Table 5E-15**)

■ Mortality by infant gender and ethnic group

The 1998 mortality risk was not equal for infants of different sexes or ethnic groups. In 1999 male infants died at a rate 28.8 percent higher than female infants. Asian infants, followed by non-Hispanic white and Hispanic babies had the lowest infant mortality rates among the ethnic groups in 1999 (**Figure 2C-2**). The IMR for white non-Hispanic infants declined by 17.4 percent from 6.9/1,000 in 1998 to 5.7/1,000 in 1999. The IMR for Black babies declined by 2.8 percent, from 14.2 in 1998 to 13.8 in 1999. Black infants continued to have in 1999 the worst survival chances among the ethnic groups, followed by American Indians (**Figure 2C-1**). The risk of dying for Black infants was 2.4 times greater than the risk for non-Hispanic whites and 6 times greater than the risk for Asians. American Indian infants were 3.7 times more likely to die before their first birthday (8.5 infant deaths per 1,000 live births) in 1999 than Asian infants, the group with lowest IMR of 2.3/1,000.

■ Causes of infant death

Both the number of deaths and mortality rates for four of the five leading causes of infant mortality (*certain conditions originating in the perinatal period*, *birth defects*, *sudden infant death syndrome* and *pneumonia/influenza*) declined in 1999 (**Table 2C-5**, **Table 2C-6**). In contrast, the number of *unintentional injury* deaths among infants increased from 14 in 1998 to 26 in 1999 (**Table 2C-5**).

The number of deaths from *sudden infant death syndrome* (SIDS) declined from 111 in 1989 to 38 in 1999, and the 1999 SIDS rate was 70.6 percent lower than the rate reported for 1989 (**Figure 2C-3**). In 1999, SIDS accounted for 7.4 percent of total infant mortality compared to 18.7 percent in 1989 (**Figure 2C-4**). American Indian babies were 3 times and Black infants 4.3 times more likely to die from SIDS than non-Hispanic white infants (**Table 2C-7).**

CHILDHOOD MORTALITY

Death claimed the lives of 246 of the 1,022,514 children (1 to 14 years old) residing in Arizona in 1999. Children in 1999 had better survival chances than children in 1989, as reflected in the 31.3 percent reduction of the mortality risk. The rate of 24.1 deaths per 100,000 children was the lowest rate of the eleven-year period from 1989 to 1999 (**Table 2C-8**). One in 4,157 children died in 1999 compared to one death for every 2,849 in 1989.

■ Leading causes of childhood mortality

Mortality rate for all *unintentional injuries* combined declined by 46.7 percent from a peak of 18.2/100,000 in 1995 to 9.7/100,000 in 1999 (**Table 2C-8)**. Forty of every 100 children who died in 1999 did so from an unintentional injury, compared to 62 percent in 1995. *Drowning* had the largest decline in rate (52.2 percent). The 1999 death rate for *injuries inflicted by motor vehicles* was 5.8/100,000, 36.3 percent lower than in 1995 when it also reached its recent peak of 9.1/100,000 (**Table 2C-8**).

Lower death rates for *unintentional injuries*, *homicide* and *suicide* contributed to the decrease in total mortality of children from 1998 to 1999. In contrast, mortality rates for *birth defects and cancer* were higher in 1999 than they were in 1998 (**Table 2C-8).**

Seven children, six boys and one girl committed *suicide* in 1999. Eleven children were *murdered* in Arizona in 1999 (**Table 2C-11**) compared to 25 in 1998.

■ Gender differences

Both genders experienced declines in their total mortality rates (**Figure 2C-5**, **Table 2C-8**). Compared to 1989, the 1999 rates for four of the five leading causes of death were lower among both girls and boys.

Despite the improvement in their chances of survival in 1999, boys had a mortality rate that exceeded by 27 percent the death rate among girls (26.8 vs. 21.1).

The 1999 total mortality rate for girls was 24.6 percent lower than the year 2000 target rate of 28/100,000. The 1999 rate for boys was 4.3 percent lower than the year 2000 health objective.

■ Urban/rural differences

In 1998, the first and only time in two decades, the total mortality rate of rural children was lower than the rate of urban children. In 1999, the mortality rate of rural children had increased again and exceeded by 42 percent the rate of urban children (**Figure 2C-6**, **Table 2C-9**).

The 1999 unintentional injury death rate of urban children was the lowest of the past eleven years, having dropped 46.4 percent from the 1989 rate (**Figure 2C-6, Table 2C-9**). In contrast, the unintentional injury death rate of rural children had increased in 1999 by 25 percent.

One of the national objectives set by the U.S. Public Health Service for the year 2000 is to reduce motor vehicle-related deaths among children 1-14 years old to no more than 5.5 per 100,000. The 1999 rate of urban children was 10.9 percent lower than the target rate (**Table 2C-9**). The rate for rural children was 63.6 percent greater than the objective.

Urban females and rural males were the two gender by region groups with greater mortality risk in 1999 than in 1998 (**Table 2C-10**).

ADOLESCENT MORTALITY

The lives of 277 of the 340,321 resident adolescents (15-19 year olds) prematurely ended in 1999, resulting in a total mortality rate of 81.4 deaths per 100,000 adolescents. This mortality rate was 10.5 percent lower than the 1998 rate of 90.9/100,000 and was the lowest rate of the eleven-year period from 1989 to 1999 (**Table 2C-12**).

■ Leading causes of death

Motor vehicle crashes, *homicides* and *suicides* continued to be the three causes with the greatest number of deaths for this age group in 1999 (**Table 2C-15**). Four out of every ten (36.1 percent) deaths among adolescents in 1999 was from a *motor vehicle-related injury*. Another three out of ten adolescents who died in 1999 were either murdered or committed suicide. However, mortality rates for the five leading causes of adolescent deaths were lower in 1999 than they were in 1998. The death rate for *suicide* declined for the second consecutive year from 23.7/100,000 in 1997 to 10.6/100,000 in 1999. The latter was lowest suicide death rate for Arizona adolescents 15-19 years old in two decades. The homicide death rate declined for the 4th consecutive year from 33.4/100,000 in 1995 to 16.2 in 1999.

■ Gender differences

The suicide death rate for adolescent males declined by 57.8 percent from a peak of 41.0/100,000 in 1994 to 17.3/100,000 in 1999 (**Figure 2C-7**, **Table 2C-12**). The suicide death rate for adolescent females declined by 61.3 percent from 8.0/100,000 in 1997 to 3.1/100,000 in 1999. Despite the improvement, male adolescents were 5.6 times more likely to kill themselves in 1999 than female adolescents.

Moreover, male compared to female adolescents had a 4.6 times higher mortality risk from homicide in 1999 (25.6/100,000 and 5.6/100,000 respectively). The 1999 male adolescent homicide death rate exceeded four of the five cause-specific death rates for female adolescents.

From 1998 to 1999, the homicide death rate increased by 5.4 percent for male adolescents, but it dropped 33.3 percent for female adolescents (**Figure 2C-8, Table 2C-12).**

■ Urban/rural differences

Rural adolescents had a substantially greater improvement in their survival chances from 1989 to 1999 than did urban adolescents (32.6 and 17.4 percent respectively; **Table 2C-13**). In 1989 the mortality differential of rural compared to urban adolescents was 1.6:1 and in 1999 it has decreased to 1.3:1.

Despite the improvement, rural compared to urban adolescents had a 2.2 times greater likelihood to be the victim of a fatal motor vehicle crash in 1999. The suicide rate of rural adolescents in 1999 was 2 times greater than the rate of urban adolescents (16.8 and 8.4 respectively). In contrast, the homicide death rate of urban adolescents (18.9/100,000) was 4.1 times greater than the homicide death rate among their rural peers (4.6/100,000).

Using urban female adolescents, the most advantaged subgroup, for comparison base, in 1999 for every death per 100,000 urban females there were 1.1 deaths per 100,000 rural female adolescents, 2.8 deaths per 100,000 urban male adolescents and 3.9 deaths per 100,000 rural male adolescents.

MORTALITY OF YOUNG ADULTS

During an average week in 1999, 56 young adults aged 20 to 44 died. The 2,929 premature deaths among 1,808,028 young adult residents of Arizona produced a 1999 mortality rate of 162.0 per 100,000, 12.3 percent lower than the 1998 rate. However, the 1999 total mortality rate for young adults was 4.4 percent greater than their mortality rate in 1989 (**Table 2C-16**). Neither female nor male young adults improved their survival chances between 1989 and 1999. Compared to 1989, the female mortality rate was 19.6 percent higher and the male death rate was lower by a mere 1.6 percent in 1999 (**Figure 2C-9**, **Table 2C-16**).

■ Leading causes of death

Among the five leading causes of death of young adults, only the death rate for *HIV infection* decreased substantially from a peak of 25.4/100,000 in 1994 to 5.4/100,000 in 1999 (**Figure 2C-10**, **Table 2C-16**). Of particular note, *human immunodeficiency virus (HIV) infection* dropped from being the 5th leading cause of death among young adults in 1996 to 6th leading cause in 1997 and 7th leading cause both in 1998 and 1999.

■ Gender differences

Sixty-six of the 1999 deaths from *HIV infection* (97 out of 147) occurred among Arizonans 20-44 years old. *HIV infection* was not among the five leading causes of death for females in the 1989-1999 period. Males accounted for 85 (88 percent) of 97 young adult deaths from *HIV infection* in 1999.

The male death rate for *HIV infection* declined 79.6 percent from a high of 45.2/100,000 in 1995 to 9.2/100,000 in 1999. From 1989 to 1996, *HIV infection* was the third leading cause of death among male young adults in Arizona. It was the 6th leading cause of death both in 1997 and 1998. In 1999, *HIV infection* was the 7th leading cause of death among males 20 to 44 years old (**Table 2C-19**).

Despite its proportional decline in total young adult mortality, violence (*unintentional injuries in accidents*, *suicide* and *homicide*) claimed young adult men's lives at a rate (125.7/100,000) 3.3 times greater than the women's rate (38.5/100,000).

■ Urban/rural differences

The mortality disadvantage of rural compared to urban young adults slightly decreased from 1989 to 1999. Rural young adults were 29 percent more likely to die than their urban counterparts in 1999 compared to 40.5 percent more likely in 1989. In 1999, rural compared to urban young adults were 1.9 times more likely to die from a *motor vehicle-related injury* and 1.4 times more likely to commit *suicide*. In contrast, urban compared to rural young adults were 1.5 times more likely to be murdered.

Using urban female young adults, the most advanced subgroup, as the base, in 1999 for every death per 100,000 urban females there were 1.3 deaths per 100,000 rural female young adults, 2.2 deaths per 100,000 urban male young adults and 2.8 deaths per 100,000 rural male young adults.

MORTALITY OF MIDDLE-AGED ADULTS

The 988,913 middle-aged adult residents aged 45 to 64 experienced 6,696 deaths or an average of 18 deaths per day. For the second consecutive year the total mortality rate of middle-aged adults slightly increased from 667.3/100,000 in 1997 to 677.1/100,000 in 1999 (**Figure 2C-11**, **Table 2C-20**). However, the 1999 mortality rate of middle-aged adults was 11.5 percent lower than the 1989 rate.

■ Leading causes of death

In 1999, four of the leading cause-specific rates of death for middle-aged adults were lower compared to 1989. *Heart disease*, the second leading cause of death, had the largest decline in rate (25.9 percent), followed by *chronic obstructive pulmonary disease*, the fourth leading cause (28.8 percent) and *cancer*, the leading cause, (18.5 percent). The rate of death for *alcoholism*, the fifth leading cause of mortality, was 16.7 percent lower than the 1989 rate.

In contrast, middle-aged adults were more likely to die in 1999 from *unintentional injuries* (47.4/100,000), the third leading cause, than they were in 1989 (38.1/100,000).

Among the unintentional injury deaths unrelated to motor vehicles, Arizona's middle-aged adults experienced a sharp increase in mortality from *accidental drug overdoses* (**Figure 2C-12**). In 1999, 101 deaths of middle-aged adults were attributed to *accidental drug overdose*, compared to only 8 deaths in 1989. The 1999 death rate for accidental drug overdose among middle-aged Arizonans was 7.8 times greater than the rate reported for 1989 (10.2/100,000 vs. 1.3/100,000).

■ Gender differences

The 1999 total mortality rate among middle-age females was 12.9 percent lower and among middle-age males 9.9 percent lower than their respective rates in 1989 (**Table 2C-20**). Compared to 1989, the elevation of the male *heart disease* death rate over the female rate increased in 1999 (2.7 vs. 2.8:1). *Cancer*, the leading cause of death of middle-aged women also showed a larger gender differential in 1999 than in 1989, with men 19 percent (11 percent in 1989) more likely to die from this cause than women. The decrease from 1989 to 1999 in mortality risk for *chronic obstructive pulmonary disease* among females was 28.8 percent. Males only experienced one-sixth their difference of 4.4 percent. In 1999, *heart disease* and *cancer* death rates differed for males by a mere 1.6 percent, while in 1989 males were 10.3 percent more likely to die from *diseases of the heart* than *cancer*. In contrast, middle-aged females were 2.4 times as likely to die in 1999 from *cancer* than *heart disease*.

■ Urban/rural differences

The total mortality rate declined between 1989 and 1999 for both urban and rural middle-aged adults (**Table 2C-21**). Rural middle-aged adults had a substantially greater improvement in their survival chances from 1989 to 1999 (16.8 percent) than did their urban peers (8.5 percent).

In 1989, the mortality risk of rural compared to urban middle-aged adult females was 22 percent greater, while in 1999 the risk was 15 percent greater (**Table 2C-22**). The mortality risk of rural compared to urban middle-aged males fell from a 35 percent greater mortality rate in 1989 to 20 percent greater in 1999 (**Table 2C-22**).

ELDERLY MORTALITY

Life ended for 28,940 elderly persons (age 65+) in 1999 for a mortality rate of 4,203.4 per 100,000 (**Table 2C-24**), 1.8 percent lower than the 1989 rate of 4,280.3. In absolute numbers, 9,424 more elderly Arizonans died in 1999 than in 1989.

■ Leading causes of death

The rate of elderly deaths from *heart disease* declined for the sixth consecutive year and was 20.4 percent lower in 1999 than in 1989 (**Table 2C-24**). The mortality rate for *stroke* decreased by 13 percent from 341.9/100,000 in 1997 to 297.3 per 100,000 in 1999. In contrast, the death rates for *cancer*, *chronic obstructive pulmonary disease (COPD)* and *pneumonia* increased in 1999.

Fifty-two percent of the elderly deaths in 1999 were due to either *heart disease* or *cancer*. In 1988, *heart disease* was 61 percent more likely than *cancer* to claim senior lives; in 1998 the differential was 35 percent greater for *heart disease*.

The death rate for *Alzheimer's disease*, the eight leading cause of elderly mortality in Arizona since 1993, increased by 80.6 percent from 44.3/100,000 in 1989 to 80/100,000 in 1999 (**Figure 2C-13**, **Table 5E-34**). In 1989, the *Alzheimer's disease* mortality risk of elderly females compared to males was 18 percent greater, while in 1999 the risk was 58 percent greater.

Among unintentional injury deaths unrelated to motor vehicles, Arizona's elderly experienced a substantial increase in mortality from *fall-related injuries* (**Figure 2C-14**). Between 1989 and 1999, 2,325 Arizona's elderly died from *fall-related injuries*. The rate of *fall-related deaths* increased by 77 percent from 27.6/100,000 in 1989 to 48.9/100,000 in 1999. Risk of death from both *Alzheimer's disease* and *fall-related injury* increases sharply with age. Older elderly, those equal to or older than 75 years of age, made up a larger share of the general elderly population in 1999 (46.6 percent) than in 1989 (37 percent). Females accounted for 58 percent of all older elderly in Arizona in 1999.

■ Gender differences

The 1999 total mortality rate among elderly females was 5.5 percent greater than their rate in 1989. In contrast, the mortality rate among elderly males decreased 9.5 percent between 1989 and 1999 (**Table 2C-24**).

Due to differing trends by gender the male to female differential in total mortality fell from 39 percent greater for males in 1989 to 19 percent greater for males in 1999. Elderly females compared to males had a smaller decline in *heart disease* mortality (16.7 percent vs. 24.6 percent). In addition, death rates for *COPD* decreased for elderly males, while they increased by 33.6 percent for elderly females (**Table 2C-24**). Since 1986, elderly females in Arizona have been at a greater risk of death from *stroke* than have males.

In 1999 *Alzheimer's disease* was the 7th leading cause of death among elderly females and the 9th leading cause among elderly males (**Table 2C-27**).

■ Urban/rural differences

During the 11-year period from 1989 to 1999, annual total mortality rates were consistently lower for rural elderly than for urban elderly **(Table 2C-25**). Urban compared to rural elderly had a greater risk of dying from *heart disease* (23.1 percent), *stroke* (21.7 percent) and *COPD* (13.3 percent).

Both urban and rural females experienced an increase in mortality rates from 1989 to 1999. In contrast, mortality rates of rural and urban males were lower in 1999 than they were in 1989 (**Table 2C-26**).